

WHAT IS CLAIMED IS:

- 1 1. A brushless motor comprising:
  - 2 a stator comprising a plurality of exciting
  - 3 coils;
  - 4 a rotor rotatable relative to the stator;
  - 5 an electric circuit board comprising a control
  - 6 circuit for controlling rotation of the rotor, the
  - 7 electric circuit board having through-holes;
  - 8 a heat sink comprising a heat radiating portion
  - 9 and a pair of supporting legs extending from
  - 10 opposite end portions of the heat radiating portion,
  - 11 the heat sink being disposed on the electric circuit
  - 12 board by contacting an end portion of each of the
  - 13 supporting legs with the electric circuit board;
  - 14 a plurality of switching devices electrically
  - 15 connected with the electric circuit board, the
  - 16 switching devices controlling a direction of drive
  - 17 current supplied to exciting coils of the stator;
  - 18 and
  - 19 a pressing member comprising a pressing portion,
  - 20 a pair of positioning portions extending
  - 21 respectively from opposite end portions of the
  - 22 pressing portion, and a pair of connecting portions
  - 23 projecting respectively from the pair of positioning
  - 24 portions respectively, the pressing portion pressing
  - 25 the switching devices to the heat sink by engaging
  - 26 the connecting portions with the heat sink, the
  - 27 positioning portions being inserted into the
  - 28 through-holes of the electric circuit board
  - 29 respectively.
- 1 2. The brushless motor as claimed in claim 1,
- 2 wherein each of the positioning portions of the

3 pressing member has a fixing member for fixing the  
4 pressing member and the heat sink to the electric  
5 circuit board.

1 3. The brushless motor as claimed in claim 2,  
2 wherein the fixing member receives solder supplied  
3 to the through-hole and the positioning member.

1 4. The brushless motor as claimed in claim 1,  
2 wherein each of the supporting legs of the heat sink  
3 comprises a positioning projection for suppressing  
4 misregistration of the switching devices relative to  
5 the heat sink and a connecting projection for  
6 connecting the heat sink and the pressing member,  
7 the positioning projection and the connecting  
8 projection project from an inside surface of each of  
9 the supporting legs inwardly.

1 5. The brushless motor as claimed in claim 1,  
2 wherein the pressing member further comprises a pair  
3 of fixing portions which are formed at free end  
4 portions of the positioning portions, and the fixing  
5 portions are hung with a lower surface of the  
6 electric circuit board.

1 6. The brushless motor as claimed in claim 5,  
2 wherein the fixing portion is formed by forming an  
3 inversed U-shaped slit on the positioning portion  
4 and bending a portion defined by the inversed  
5 U-shaped portion outwardly.

1 7. The brushless motor as claimed in claim 1,  
2 wherein the fixing portion is formed by forming slit

3 at right and left sides of each positioning portion  
4 and by bending side parts defined by the slits  
5 outwardly.

1 8. The brushless motor as claimed in claim 1,  
2 wherein the positioning portions of the pressing  
3 member are formed such that a part of each  
4 positioning portion located in the through-hole is  
5 provided with one of a cutout, a depression and a  
6 through-hole so that solder is easily supplied to  
7 the through-hole of the electric circuit board and  
8 the positioning portion.

1 9. The brushless motor as claimed in claim 1,  
2 wherein the pressing member further comprises a  
3 plurality of spring pieces which are provided  
4 laterally in the pressing portion of the pressing  
5 member and which are upwardly bent from the pressing  
6 portion so as to push the switching devices to the  
7 heat sink.

1 10. The brushless motor as claimed in claim 6,  
2 wherein the pressing member further comprises a  
3 plurality of positioning pieces which are provided  
4 between the spring pieces so as to restrict  
5 positions of the switching devices.

1 11. The brushless motor as claimed in claim 1,  
2 wherein a pair of surrounding wall are provided and  
3 front and rear longitudinal peripheries of the  
4 pressing portion of the pressing member so as to  
5 improve rigidity of the pressing portion and to  
6 function as a shielding board for shielding noises

7 to the switching devices.

1 12. The brushless motor as claimed in claim 1,  
2 wherein the heat radiating portion of the heat sink  
3 includes a plurality of fins.

1 13. The brushless motor as claimed in claim 1,  
2 wherein each of the switching devices has a  
3 plurality of terminals which are perpendicularly  
4 bent at a near portion to a transistor of the  
5 switching device, and free end portions of the  
6 terminals are inserted to predetermined positions of  
7 the electric circuit board and are electrically  
8 connected with the electric circuit board by means  
9 of soldering.

1 14. The brushless motor as claimed in claim 1,  
2 wherein the pressing member is made by blanking  
3 plate-spring material into a predetermined shape and  
4 by bending predetermined portions of a member of the  
5 predetermined shape.

1 15. The brushless motor as claimed in claim 1,  
2 wherein the fixing portions receive solder applied  
3 to the through-holes and the positioning portions.

1 16. The brushless motor as claimed in claim 1,  
2 wherein the fixing portions receive solder applied  
3 to the through-holes and the positioning portions.

1 17. The brushless motor as claimed in claim 1,  
2 wherein outer surfaces of the supporting legs of the  
3 heat sink are machined into rough surfaces so that

4 solder attached on the outer surfaces is easily  
5 detached.

1 18. The brushless motor as claimed in claim 1,  
2 wherein outer surfaces of the supporting legs of the  
3 heat sink are machined into rough surfaces by means  
4 of one of knurling and sandblasting.

1 19. The brushless motor as claimed in claim 1,  
2 wherein the positioning portions are inserted into  
3 the through-holes of the electric circuit board  
4 respectively so that the pressing member and the  
5 heat sink are located at predetermined positions  
6 relative to the electric circuit board.

1 20. An assembly structure of a brushless motor,  
2 comprising:  
3 a circuit board comprising a control circuit  
4 for controlling a rotation of a rotor relative to a  
5 stator of the brushless motor and through-holes;  
6 a heat sink comprising a heat radiating portion  
7 and a pair of supporting legs extending from  
8 opposite sides of the heat radiating portion, a free  
9 end portion of each supporting leg being in contact  
10 with the electric circuit board;  
11 a plurality of switching devices electrically  
12 connected with the electric circuit board, the  
13 switching devices controlling a direction of drive  
14 current supplied to exciting coils of the stator;  
15 and  
16 a pressing member comprising a pressing portion,  
17 a pair of positioning portions perpendicularly  
18 extending from opposite end portions of the pressing

19 portion, and a pair of connecting portions  
20 projecting from the pair of positioning portions  
21 respectively, the connecting portions being engaged  
22 with the supporting legs respectively, the pressing  
23 portion pressing the switching devices to the heat  
24 sink, the positioning portions being inserted into  
25 the through-holes of the electric circuit board  
26 respectively.

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25 the through-holes of the electric circuit board  
26 respectively.